ISSN (print) 0093-4666 © 2013. Mycotaxon, Ltd. ISSN (online) 2154-8889

MYCOTAXON

http://dx.doi.org/10.5248/123.221

Volume 123, pp. 221–228 *January–March 2013*

Two new species of *Endophragmiella* from Spain

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Abstract — Two new species of *Endophragmiella* are described and illustrated. *Endophragmiella bicolorata* is characterized by (1–)2(–3)-septate conidia with a dome-shaped hyaline to subhyaline apical cell and brown basal and middle cells, a pigmentation pattern not previously described for species of this genus. *Endophragmiella cantabrica* is distinguished from species with 1-septate conidia by oblong, ellipsoidal, or sometimes ovoid conidia comprising two equal and uniformly pale brown cells.

Key words — anamorphic fungi, plant debris, taxonomy

Introduction

Sutton (1973) established *Endophragmiella* for two species: *E. pallescens* B. Sutton, selected as type, and *E. canadensis* (Ellis & Everh.) B. Sutton, currently considered a synonym of *E. subolivacea* (Ellis & Everh.) S. Hughes. Hughes (1979) clarified the conidiogenesis in *Endophragmiella*, and amended the genus definition. Subsequently, Kirk (1985), Holubová-Jechová (1986), and Wu & Zhuang (2005) contributed to the knowledge of the genus with keys based on morphological revisions of the species.

Endophragmiella is characterized by simple or branched conidiophores, monoblastic percurrently proliferating conidiogenous cells, and conidia with very variable morphology and septation, seceding rhexolytically. The species are mostly saprobes occurring on rotten wood, dead branches, and decaying leaves of different plants. Currently, more than 80 species are accepted in the genus (Rifai 2008, Ma et al. 2011, Ren et al. 2011, Seifert et al. 2011).

During an extensive survey of anamorphic fungi on plant debris in the Iberian Peninsula, two *Endophragmiella* species were found. We propose these as new species based on conidial morphology, size, and pigmentation.

Materials & methods

Samples of plant material were processed using the methodology described by Castañeda-Ruiz (2005). Fungal specimens were studied and illustrated following the procedure described by Hernández-Restrepo et al. (2012). All attempts to isolate the specimens in pure culture failed, despite trying different media and culture conditions; therefore, only dried material is preserved. Specimens are deposited in the herbariums of the CBS-KNAW Fungal Biodiversity Centre, Utrecht, the Netherlands (CBS) and Faculty of Medicine, Reus, Spain (FMR).

Taxonomy

Endophragmiella bicolorata Hern.-Rest., J. Mena, Guarro & Gené, **sp. nov.**

MycoBank. MB 800594 Figs 1, 2

Differs from *Endophragmiella oblonga* by the conidial cell pigmentation pattern and dome-shaped apical cell.

Type: Spain, Valencia, Km 21 Road CV 425, Los Pedrones direction to Buñol, 39°18′28″N 0°52′38″W, on dead wood, 15/3/2010, M. Hernández-Restrepo & K. Rodríguez (**Holotype**, CBS H-21042; **Isotype**, FMR 10965).

Etymology: Latin *bicolorata*, referring to the pigmentation of conidia.

Colonies on the natural substratum effuse, hairy, black. Mycelium mostly immersed, composed of septate, smooth, subhyaline to pale brown hyphae, 2–3 µm wide. Conidiophores macronematous, simple, erect, straight or slightly flexuous, smooth, septate, brown, paler towards the apex, up to 125 µm long, 2–5 µm wide at the base, with up to 9 percurrent proliferations. Conidiogenous cells monoblastic, integrated, terminal, percurrent, cylindrical, tapered to a truncate apex. Conidia acrogenous, solitary, simple, ellipsoidal to oblong ellipsoidal, sometimes obclavate or obovoid, (1-)2(-3)-septate, often constricted at the septa, basal and middle cells brown, apical cell hyaline to subhyaline and dome-shaped, smooth all over, 19–26.5 × 7.5–13 µm, with a distinct subhyaline basal frill, 1.5–4 × 2–3 µm. Teleomorph unknown.

Note: This species resembles *Endophragmiella oblonga* (Matsush.) S. Hughes in morphology and conidial size, but the *E. oblonga* conidia are less variable in shape (Matsushima 1975, Hughes 1979). Although both species have a dome-shaped apical cell, their pigmentation pattern distinguishes the two; in *E. oblonga* the middle cell is brown and the end cells are pale brown (Hughes 1979, Mel'nik 2000).

Other *Endophragmiella* species with 2-septate conidia somewhat similar to *E. bicolorata* are *E. collapsa* (B. Sutton) S. Hughes, *E. ontariensis* S. Hughes, *E. suboblonga* W.P. Wu, and *E. tripartita* S. Hughes. However, the conidia of *E. collapsa* are smaller (14.4–17(–20) × 7.2–8.3(–9) µm) and have pale brown to dark brown distal cells and a basal cell that is paler and sometimes collapsed (Sutton 1973, Hughes 1979, Wu & Zhuang 2005). In *E. ontariensis*, the conidia

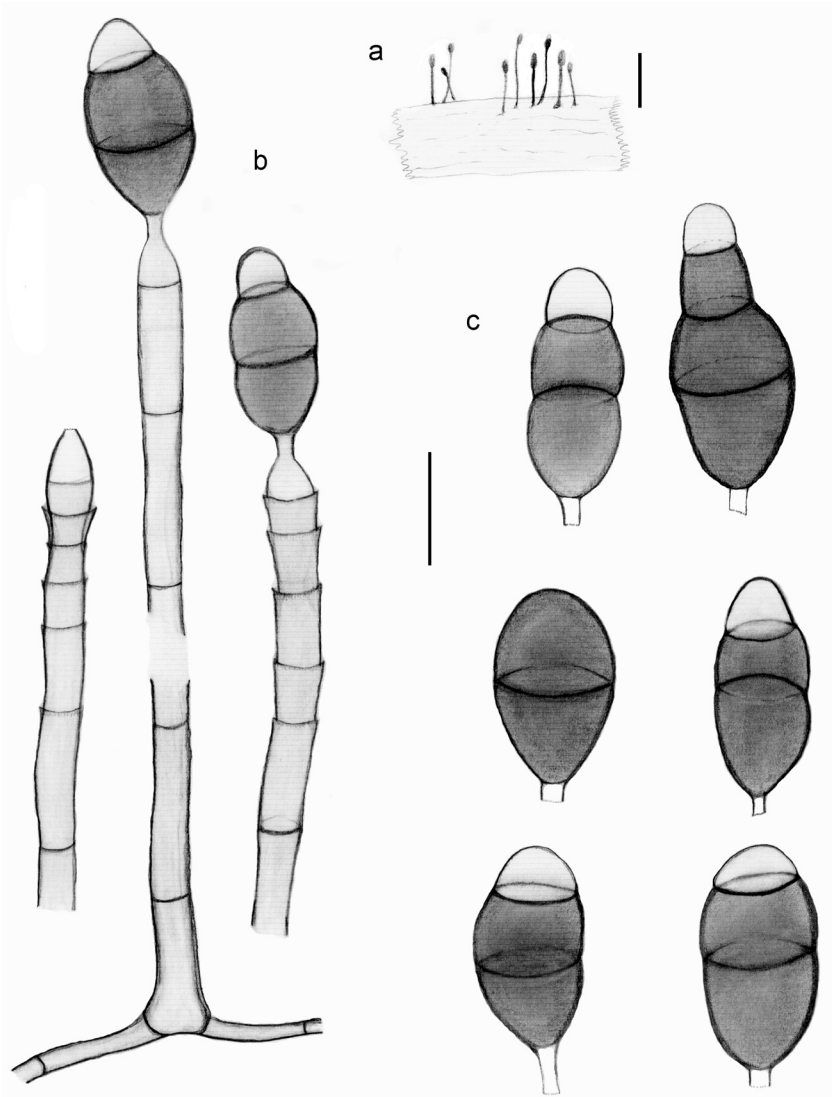

Fig. 1. *Endophragmiella bicolorata* (CBS H-21042). **a.** Habit. **b.** Conidiophores and conidiogenous cells producing conidia. **c.** Conidia. Scale bars: a = 100 µm; b,c = 10 µm.

are also smaller (18–22 × 8.5–11 µm) and have pale brown to dark brown distal cells and pale brown basal cells (Hughes 1978a, Wu & Zhuang 2005). The conidia of *E. suboblonga* measure 18–20 × 9–13 µm and have the middle

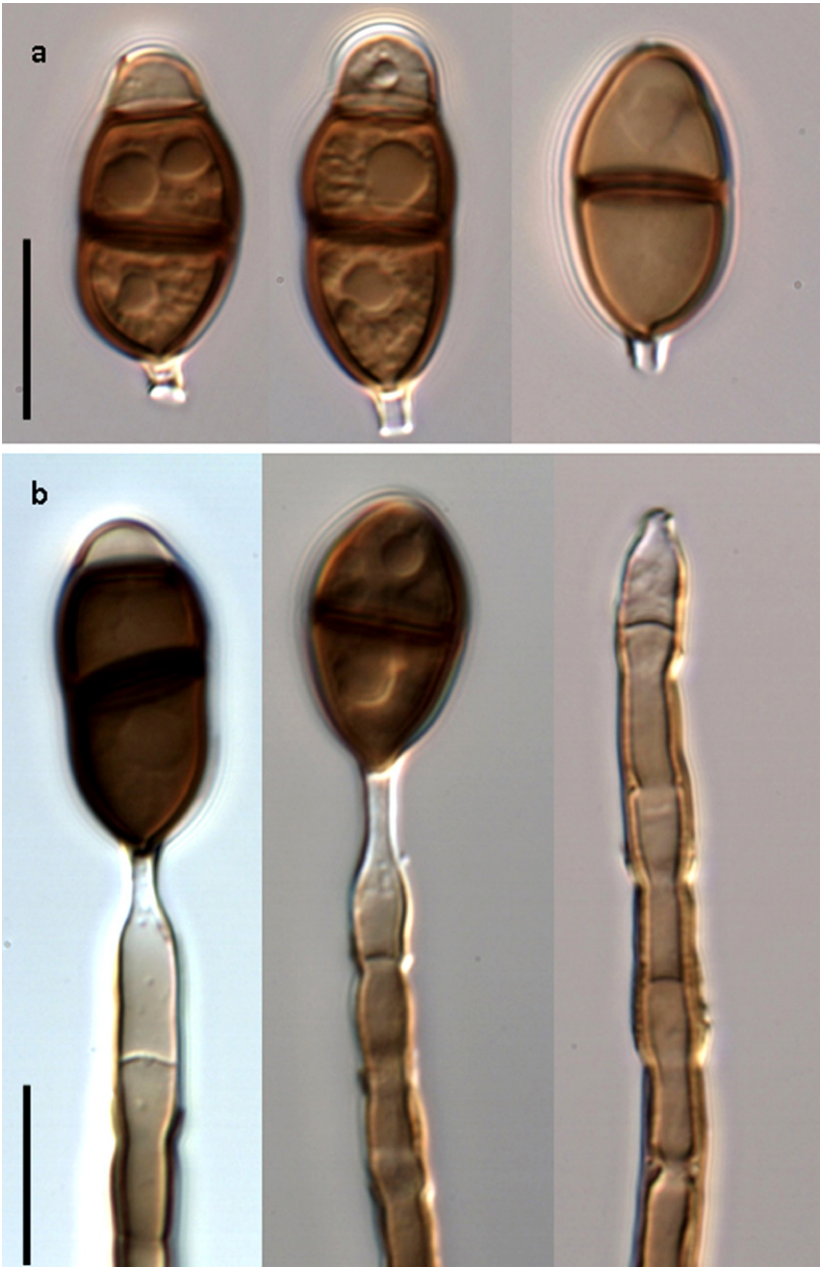

Fig. 2. *Endophragmiella bicolorata* (CBS H-21042). **a.** Conidia. **b.** Conidiophores, conidiogenous cells with conidia. Scale bars: 10 µm.

cell brown and larger and both apical and basal cells paler and smaller (Wu & Zhuang 2005). The conidia of *E. tripartita* measure (16–)18–21.5(–23.5) × 8.1–9.5 µm and have all cells brown to dark brown (Hughes 1979).

Endophragmiella cantabrica J. Mena, Hern.-Rest., Guarro & Gené, **sp. nov.**

MycoBank. MB 800595 Figs 3, 4

Differs from all other bicellular *Endophragmiella* species by its conidial size.

Type: Spain, Cantabria, Los Tojos, Barcená Mayor, Saja-Besaya Natural Park. 43°06′42.81″N 4°12′13.48″W, 675 m.a.s.l., on dead wood, 12/7/2010, M. Hernández-Restrepo, J. Mena & J. Guarro (**Holotype**, CBS H-21043; **Isotype**, FMR 11857).

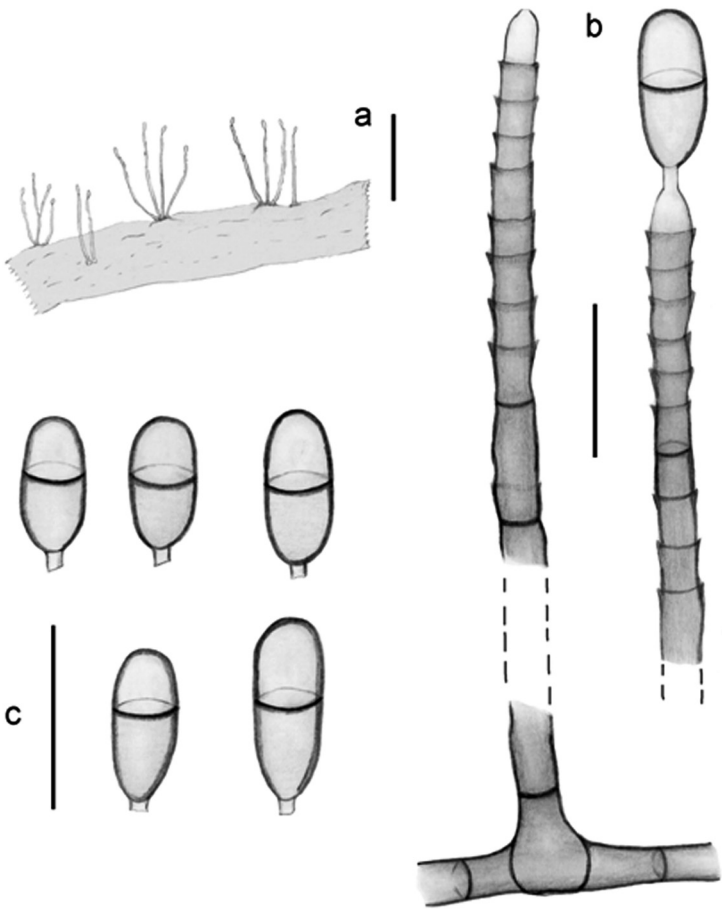

Fig. 3. *Endophragmiella cantabrica* (CBS H-21043). **a.** Habit. **b.** Conidiophores and conidiogenous cells producing conidia. **c.** Conidia. Scale bars: a = 200 µm; b,c =10 µm.

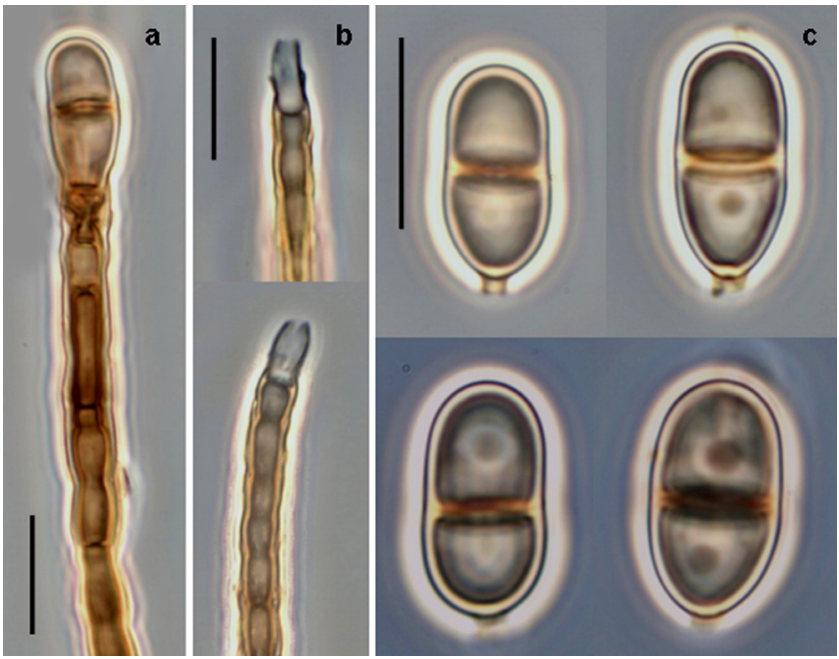

Fig. 4. *Endophragmiella cantabrica* (CBS H-21043). **a.** Conidiophore. **b.** Detail of conidiogenous cells. **c.** Conidia. Scale bars: 10 µm.

Etymology. Latin *cantabrica*, referring to the Spanish region where the fungus was collected.

Colonies on the natural substratum effuse, hairy, brown. Mycelium mostly immersed, composed of septate, smooth or verruculose, subhyaline to pale brown hyphae, 1.5–3 µm wide. Conidiophores macronematous, simple, erect, straight or slightly flexuous, smooth, septate, brown, paler towards the apex, up to 195 µm length, 5–6 µm wide at the base, with up to 20 percurrent proliferations. Conidiogenous cells monoblastic, integrated, terminal, percurrent, cylindrical, tapered to a truncate apex. Conidia acrogenous, solitary, simple, oblong, ellipsoidal, sometimes ovoid, 1-septate, pale brown, with both cells equal and uniformly pigmented, smooth, 10–14 × 5–6 µm, with a distinct subhyaline basal frill, 0.5–1.5 × 0.5–1.5 µm. Teleomorph unknown.

Note: Among the taxa of *Endophragmiella* with 1-septate conidia, *E. cantabrica* has some similarities with *E. arranensis* P.M. Kirk, *E. bogoriensis* Rifai, *E. ovoidea* P.M. Kirk and *E. uniseptata* var. *pusilla* Hol.-Jech. *Endophragmiella arranensis* has very short conidiophores (≤45 µm long after successive percurrent proliferations) and smaller conidia (6.5–9.5 × 4–5 µm) with the basal cell paler

than the apical one (Kirk & Spooner 1984). The other three species have more pigmented and larger conidia: 12–18 × 7–9 µm in *E. bogoriensis*, (10–)14–16 × (5–)5.5–6.5 µm in *E. ovoidea*, and (9–)15(–17) × (7–)9(–10) µm in *E. uniseptata* var. *pusilla* (Kirk 1981, Holubová-Jechová 1986, Mel'nik 2000, Rifai 2008).

Other *Endophragmiella* taxa with 1-septate conidia slightly similar to *E. cantabrica* in conidial morphology are: *E. angustispora* S. Hughes, *E. resinae* P.M. Kirk, and *E. uniseptata* (M.B. Ellis) S. Hughes var. *uniseptata*. Conidia of *E. angustispora*, however, are navicular to ellipsoidal or narrowly ovoid, 14.4–20.5 × 4.5–5.4 µm (Hughes 1978b); those of *E. resinae* are ovoid to pyriform, 17–22 × 9–10.5 µm (Kirk 1981); and those of *E. uniseptata* var. *uniseptata* are ellipsoidal, obovoid to pyriform, broadly obtuse at the distal end, 13–27 × 9–12 µm (Ellis 1959, Hughes 1979, Holubová-Jechová 1986).

Acknowledgments

The authors would like to thank Dr. Rafael F. Castañeda Ruiz, Dr. Cony Decock, and Dr. David Minter for their critical review of the manuscript. This study was supported by the Spanish Ministerio de Economía y Competitividad, grant CGL 2011-27185.

Literature cited

Castañeda-Ruiz RF. 2005. Metodología en el estudio de los hongos anamorfos. 182–183, in: Anais do V Congresso Latino Americano de Micología. Brasilia.

Ellis MB. 1959. *Clasterosporium* and some allied *Dematiaceae*. Phragmosporae I. Mycological Papers 72: 1–75.

Hernández-Restrepo M, Silvera-Simón C, Mena-Portales J, Mercado-Sierra A, Guarro J. & Gené J. 2012. Three new species and a new record of *Diplococcium* from plant debris in Spain. Mycological Progress 11: 191–199. http://dx.doi.org/10.1007/s11557-011-0741-6.

Holubová-Jechová V. 1986. Lignicolous hyphomycetes from Czechoslovakia 8. *Endophragmiella* and *Phragmocephala*. Folia Geobotánica et Phyto-taxonomica 21: 173–198. http://dx.doi.org/10.1007/BF02854666.

Hughes SJ. 1978a. *Endophragmiella ontariensis*. Fungi Canadenses 128: 1–2.

Hughes SJ. 1978b. *Endophragmiella angustispora*. Fungi Canadenses 123: 1–2.

Hughes SJ. 1979. Relocation of species of *Endophragmia* auct. with notes on relevant generic names. New Zealand Journal of Botany 17: 139–188.

Kirk PM. 1981. New or interesting Microfungi I. Dematiaceous hyphomycetes from Devon. Transaction of the British Mycological Society 76: 71–87. http://dx.doi.org/10.1016/S0007-1536(81)80010-1.

Kirk PM. 1985. New or interesting Microfungi XIV. Dematiaceous hyphomycetes from Mt Kenya. Mycotaxon 23: 305–352.

Kirk PM, Spooner BM. 1984. An account of the fungi of Arran, Gigha and Kintyre. Kew Bulletin 38: 503–597.

Ma LG, Ma J, Zhang YD, Zhang XG. 2011. Taxonomic studies of *Endophragmiella* from southern China. Mycotaxon 117: 279–285. http://dx.doi.org/10.5248/117.279.

Matsushima T. 1975. Icones Microfungorum a Matsushima lectorum. Published by the author. Kobe, Japan.

Mel'nik VA. 2000. Classis Hyphomycetes Fasc 1 Fam. *Dematiaceae*. Nauka. Petropoli.

Ren LG, Ma JJ, Zhang XG. 2011. A new species and new records of *Endophragmiella* from China. Mycotaxon 117: 123–130. http://dx.doi.org/10.5248/117.123.

Rifai MA. 2008. *Endophragmiella bogoriensis* Rifai, spec. nov. Reindwardtia 12: 275–276.

Seifert K, Morgan-Jones G, Gams W, Kendrick B. 2011. The genera of hyphomycetes. CBS Biodiversity Series 9. CBS-KNAW Fungal Biodiversity Centre. Utrecht.

Sutton BC. 1973. Hyphomycetes from Manitoba and Saskatchewan, Canada. Mycological Papers 132: 1–143.

Wu WP, Zhuang WY. 2005. *Sporidesmium, Endophragmiella* and related genera from China. Fungal Diversity Research Series 15. Fungal Diversity Press. Hong Kong.